UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/314,540	05/19/1999	ROBERT S. LANGER	0492611-0335	5363

7590 12/09/2002

SAM PASTERNACK
CHOATE HALL & STEWART
EXCHANGE PLACE
53 STATE STREET
BOSTON, MA 021092891

EXAMINER
RUSSEL, JEFFREY E

ART UNIT	PAPER NUMBER
1654	23

DATE MAILED: 12/09/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/314,540	LANGER ET AL.	
	Examiner	Art Unit	
	Jeffrey E. Russel	1654	

-- The MAILING DATE of this communication appears on the cover sheet with the correspond nce address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 September 2002* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,6-13,65-68,73 and 74* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,6-13,65-68,73 and 74* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *6* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submissions filed on June 3, 2002 and September 30, 2002 have been entered.

2. This application contains sequence disclosures that are encompassed by the definitions for nucleotide and/or amino acid sequences set forth in 37 CFR 1.821(a)(1) and (a)(2). However, this application fails to comply with the requirements of 37 CFR 1.821 through 1.825 for the following reasons:

Amino acid sequences which are subject to the sequence disclosure rules are present, e.g., at page 9, lines 23, 24, and 26; page 15, lines 17, 19, 23, 25, and 27; page 16, lines 3 and 9; and page 19, line 9; of the specification. However, no sequence listing has been submitted. Further, SEQ ID NOS must be inserted after every amino acid sequence subject to the sequence disclosure rules. See 37 CFR 1.821(d).

Applicant must provide an original computer readable form (CRF) copy of the Sequence Listing, an original paper copy of the Sequence Listing as well as an amendment directing its entry into the specification, and a statement that the content of the paper and computer readable copies are the same and include no new matter as required by 37 CFR 1.825(a) and (b).

3. The disclosure is objected to because of the following informalities: At page 10, line 6, "bond" should be changed to "bone". At page 13, line 4, "t he" should be re-written as a single word. At page 17, line 15, "fo" should be changed to "of". Appropriate correction is required.

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 67 and 68 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. There is no original disclosure supporting the recitations in claims 67 and 68 that the biomaterial architecture can be a particle or a nanosphere. While there is original disclosure in the examples of the biomaterial architecture being in the form of microparticles, "microparticle" is not synonymous with "particle" or "nanosphere". Applicants have not indicated where the original disclosure supports the new claim limitations.

5. Claims 1-3, 6-13, 65-68, 73, and 74 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is not clear if claim 3 merely recites an inherent feature of the independent claim, or if claim 3 further limits the scope of the independent claim. In particular, independent claim 2 requires an anchor-adapter-tag unit, which as described in the specification (see page 5, lines 20-21) is a three-component system. Under this interpretation of the claim language, claim 3 is of identical scope as the independent claim, and should be canceled as being redundant. Alternatively, if dependent claim 3 should be interpreted as meaning that the independent claim embraces two-component "anchor-tag" systems, then the "anchor-adapter-tag unit" language of the claims is indefinite because it is not clear that two-component systems are embraced thereby. Clarification is required. [For purposes of this Office

action, the examiner assumes that Applicants intend to limit their claims to a three-component system, consistent with Applicants' remarks in the response filed October 19, 2001, page 8, first full paragraph.] There is no antecedent basis in the claims for the phrase "said biodegradable polymer" in claims 10, 73, and 74. Note that independent claim 2 does not require the polymer to be biodegradable. There is no antecedent basis in the claims for the phrase "the required specificity" at claim 12, line 2. There is no previous mention of a specificity or an antibody specificity in the claims. It is recommended that at claim 12, line 2, "the required" be deleted.

6. Claim 74 is objected to because of the following informalities: At claim 74, line 1, "is" should be inserted after "polymer". Appropriate correction is required.

7. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-3, 6-11, 13, 66, 73, and 74 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-52 of copending Application No. 09/600,502. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of the '502 application anticipate the instant claims. In particular, the '502 application claims (see especially claims 1, 3, 6, and

11) the ligand-biotin-avidin or streptavidin-biotin-PLA-PEG structure required by the instant claims.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for the purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

9. Claims 1-3, 6-9, 11, 13, and 66 are rejected under 35 U.S.C. 102(a) as being anticipated by the Patel et al article (FASEB J., Vol. 12, pages 1447-1454). The Patel et al article teaches peptide ligands attached to biodegradable PLA-PEG polymers through an anchor-adapter-tag component comprising biotin-avidin-biotin. See, e.g., the Abstract and Figure 1.

10. Claims 1-3, 6-9, 11, 13, and 66-68 are rejected under 35 U.S.C. 102(a) as being anticipated by the Cannizzaro et al article (Biotechnol. Bioeng., Vol. 58, pages 529-535). The Patel et al article teaches peptide ligands attached to biodegradable PLA-PEG polymers in the form of microparticles through an anchor-adapter-tag component comprising biotin-avidin-biotin. See, e.g., the Abstract; page 529, column 2, last paragraph; and page 530, column 2.

11. Claims 2, 3, 8, and 13 are rejected under 35 U.S.C. 102(b) as being anticipated by the Davies et al article (Langmuir, Vol. 10, pages 2654-2661). The Davies et al article teaches a

polystyrene substrate (which corresponds to Applicants' biomaterial architecture), which is coated with streptavidin (which corresponds to Applicants' anchor), to which is attached a biotinylated antibody (which corresponds to Applicants' adapter-tag), to which is bound an antigen (which corresponds to Applicants' ligand). See, e.g., the Abstract and Figure 1.

12. Claims 1-3, 6-8, 10, 11, 13, 66, 73, and 74 are rejected under 35 U.S.C. 102(b) as being anticipated by Boyce (U.S. Patent No. 5,273,900). Boyce teaches biotinylated collagen (which corresponds to Applicants' anchor attached to or incorporated into a biodegradable polymer) to which is attached a biotinylated biologically active molecule (which corresponds to Applicants' tag attached to a ligand) through avidin (which corresponds to Applicants' adapter). The collagen is combined with a mucopolysaccharide in the form of membranes, which can be laminated and crosslinked. The biologically active molecule can be various growth factors, hormones, antibiotic, or anti-inflammatory compounds (which correspond to Applicants' therapeutic agent). See, e.g., Figure 12E; column 7, lines 7-62; and column 10, lines 6-44. Collagen is a polyamide and a polyprotein.

13. Claims 1-3, 6-8, 10, 11, 13, 66-68, 73, and 74 are rejected under 35 U.S.C. 102(b) as being anticipated by Li et al (U.S. Patent No. 5,512,294). Li et al teach nanoscale polymerized liposome particles to which is attached metal chelators and imaging enhancement agents, and also to which is attached biotin groups for binding of biotinylated antibodies through avidin or streptavidin. Polymers such as polyethylene glycol, polypropylene glycol, and polyglycine (which is a polyamide) can be present as part of the polymerized liposomes. See, e.g., the Abstract; Figure 16; column 2, lines 58-66; column 4, lines 8-9; column 10, lines 4-23; and claim 1. The polymerized liposomes correspond to Applicants' biodegradable polymer; the biotin

groups attached to the polymerized liposomes correspond to Applicants' anchor; the avidin or streptavidin correspond to Applicants' adapter; and the biotinylated antibodies correspond to Applicants' tag-ligand.

14. Claims 1-3, 6-9, 11, 13, 65, 67, and 68 are rejected under 35 U.S.C. 102(e) as being anticipated by Hirosue et al. Hirosue et al teach biodegradable polymer nanospheres encapsulating therapeutic nucleic acids. The nanospheres can be comprised of PEG-PLA. The nanospheres can be biotinylated, and avidin can be used as a bridge for attachment of biotinylated ligands. See, e.g., column 3, lines 4-15 and 42-55; column 4, lines 33-43 and 51-54; and Example 4.

15. Applicant's arguments filed September 30, 2002 have been fully considered but they are not persuasive.

The rejection over the Patel et al article (FASEB J., Vol. 12, pages 1447-1454) is re-instated because the declarations by Langer and Cannizzaro filed October 19, 2001 and by Cannizzaro filed October 3, 2000 are insufficient to show that the Patel et al article is not "by another" and therefore unavailable as prior art against the instant claims. In particular, while the declarations show that authors Patel, Padera, Sanders, Davies, Roberts, Tendler, and Williams are not inventors of the instant claimed subject matter, the remaining authors (i.e. Cannizzaro, Shakesheff, and Langer) constitute a different entity than the inventorship of the instant application (i.e. Cannizzaro, Shakesheff, Langer, plus Mueller). Accordingly, the Patel et al article is still "by another" and remains available as prior art under 35 U.S.C. 102(a).

16. The Davies et al article (Langmuir, Vol. 10, pages 2654-2661) is not applied against instant claim 1, which requires a biodegradable polymer. The polystyrene substrate/microtiter

wells used by the Davies et al article are not biodegradable, and do not suggest the use of a biodegradable substrate.

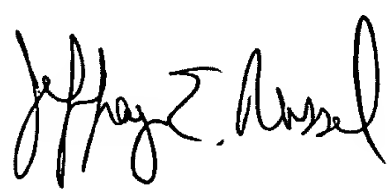
Sallberg (U.S. Patent No. 5,869,232) is cited as art of interest, being essentially duplicative of the references applied above. See, e.g., claim 11.

Masson et al (U.S. Patent No. 4,427,781) has been considered, especially with respect to instant claim 12, but is not deemed to teach or suggest the instant claimed invention. While Masson et al teach a hapten immobilized on a polymeric particle with further hapten bound to the immobilized hapten through an antibody (see, e.g., column 2, lines 40-56), Masson et al do not teach or suggest a ligand attached to the further hapten (see, e.g., column 3, lines 16-33, and column 4, lines 27-37).

17. The references crossed off of the Information Disclosure Statement filed October 3, 2000 have not been considered because the examiner was not able to locate copies of the references in the file wrapper. If Applicants will re-submit copies of these references, the examiner will consider them and make them of record.

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrey E. Russel at telephone number (703) 308-3975. The examiner can normally be reached on Monday-Thursday from 8:30 A.M. to 6:00 P.M. The examiner can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor Brenda Brumback can be reached at (703) 306-3220. The fax number for Art Unit 1654 for formal communications is (703) 305-3014; for informal communications such as proposed amendments, the fax number (703) 746-5175 can be used. The telephone number for the Technology Center 1 receptionist is (703) 308-0196.



Jeffrey E. Russel

Primary Patent Examiner

Art Unit 1654

JRussel

December 5, 2002